MAY 3 - 1977

Union Carbide Corporation
Nuclear Division
ATTN: Mr. C. C. Hopkins
Plant Manager
Post Office Box 1410
Paducah, Kentucky 42001

Gentlemen:

ANNUAL HEALTH PROTECTION APPRAISAL OF PAD, 1977

The annual health protection appraisal of PAD was conducted January 24-26, 1977, by members of the ORO Safety and Environmental Control Division. The findings were informally discussed with members of your staff at the conclusion of the appraisal.

Enclosed are six copies of the formal report of the appraisal. You may proceed with implementation of the recommendations unless there are sound reasons why they are not warranted. In any event, your comments with regard to the conduct of the appraisal, the general content of the report, and the detailed plans for implementing or otherwise handling the recommendations are requested by June 6, 1977.

The cooperation extended by members of your staff during the appraisal is appreciated.

Sincerely,

ORIGINAL SIGNED BY
H. Doran Fletcher

H. Doran Fletcher, Director
Uranium Enrichment Operations Division

OSH:RDS

Enclosure:
Appraisal Report (6 cys)

cc w/encl:
C. A. Keller, AMO
J. W. Swafford, OPE
J. K. Denton, UCC-ND

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OFFICE ➔	HP Br.	Safety Dv.	UEO Dv.			
SURNAME ➔	Smith/ndw	T				
DATE ➔	4/26/77	4/29/77	5/2/77			

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UNITED STATES
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

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USERDA-ORO

ANNUAL HEALTH PROTECTION APPRAISAL

PADUCAH GASEOUS DIFFUSION PLANT

JANUARY 1977

by

R.D. SMITH

B.J. DAVIS

SAFETY AND ENVIRONMENTAL CONTROL DIVISION

I. Introduction

The annual health protection appraisal of PAD operations was conducted on January 24-26, 1977. Areas within health physics and industrial hygiene were discussed as applicable to meet ERDA requirements of MC 0524, 0525, and 0550.

II. Summary and Conclusions

The overall health protection program including management support is considered satisfactory to meet the needs of PAD operations. Additional effort is necessary in the area of documentation of survey results on specific job functions, particularly with regard to transuranic exposure associated with cell changeout and equipment modifications, and industrial hygiene air sampling. A more efficient means of recording bioassay results should be established.

III. Recommendations

A. Recommendations from previous appraisal

75-1 Identify all areas and pieces of equipment exceeding 90 dBA and post accordingly. Mandatory hearing protection will be required for those areas. Emphasize supervision's enforcement responsibility.

All areas have been identified and posted requiring the mandatory use of hearing protection. All division superintendents have been notified of PAD's plant policy regarding hearing conservation and their responsibility to convey this policy down the chain of command. This recommendation is considered implemented.

75-2 Undertake affirmative action to eliminate noise sources or reduce generated sound levels to the extent reasonably feasible. All non-essential equipment exceeding 85 dBA shall be immediately taken out of service or modified to reduce sound levels.

Non-essential equipment exceeding 85 dBA has been removed from service. Modifications to other equipment are planned. Purchase requisitions for some noisy equipment such as lawn mowers and power tools have incorporated noise level specifications and are surveyed when delivered to plant site. One engineer has received noise control training and has prepared two excellent reports on identifying noise generation points for the C-720 flame tower and C-720 "000" stator tipping operations; recommendations were made. Since this is an ongoing program with no real end point, for the purpose of this recommendation, affirmative actions are being taken and this recommendation is considered implemented.

75-3 Health protection personnel receive prompt notification of area radioactive air samples exceeding normal operational levels.

The laboratory group responsible for counting radioactive air samples is now notifying health physics personnel immediately of out-of-spec air samples. This recommendation is considered implemented.

B. Recommendations resulting from this appraisal

It is recommended that:

77-1 health physics studies be performed for the CIP-CUP disassembly and salvage operations relative to the transuranium contamination on the equipment. See Section IV-B.

77-2 a modern system be developed for recording bioassay data. See Section IV-D.

IV. Findings

A. Feed Plant

The Feed Plant continues to be the major contributor to high airborne uranium concentrations at the PAD site; this plant is scheduled for shut down in May 1977. Until this occurs, it was suggested that respiratory protection be made mandatory in areas of concern. While out-of-spec air samples are being reported to health physics, the investigation as to its cause is primarily generic in nature and not directed strongly enough toward exposure control. While it is necessary to know a high air sample is due, for example, to a leaking packing gland, the investigation should go one step further to determine how this can be prevented in the future. PAD indicated additional effort would be placed in this area.

B. Transuranium

Common to all GDPs is a certain amount of transuranium contamination within cascade components and feed systems. This has resulted from processing reactor return material. In the future, these levels can only increase.

During the 1960s upgrading program this situation was identified and it was concluded not to be a health protection problem. However, documentation supporting this position is marginal at best. Presently, health physics practices associated with CIP-CUP are based upon the 1960 evaluation and conclusions. While these may be adequate in some cases, they are not considered conclusive or adequate for future operations since some operations have been well evaluated, while others have not received any attention. This is due primarily to priorities. Each and every operation involving transuranium contamination must be evaluated and periodically reevaluated to establish exposure control techniques and to make dose assessments. A meeting was held in Oak Ridge on February 23, 1977 with representatives of each GDP to share data and health physics control problems. A commitment was made by each GDP to continue sharing information for a more unified approach to the common problem.

C. As Low As Readily Achievable

Both internal and external exposures are far below MC 0524 standards. While there is always room for improvements, PAD, with its low exposure potential and low exposures, is considered to be operating within the spirit of as low as readily achievable.

D. Bioassay

The bioassay recordkeeping system was reviewed in considerable detail, and it is adjudged to be outdated, time-consuming and in much need of modernization. Presently, the system requires four separate hand transfers of data to record an individual's

bioassay data from the raw form to his permanent record card. At the time of this appraisal, records were approximately three months behind the analysis. With the use of a modern ADP system, the man years of clerical effort could be reduced by about two-thirds as well as the time delay from raw data to permanent record.

According to PAD SSP-1, "Radiation Control," any employee, excreting in the urine 0.87 mg/l uranium in a single sample, is to be removed immediately from work with exposure potential. A random scan of 1976 bioassay data revealed one employee who had a single sample excretion rate of 3.2 mg/l uranium on March 22, 1976. By March 27, he was excreting 0.018 mg/l uranium. More significant than the employee's rapid elimination of the uranium is the fact no record existed indicating that the employee was placed on work restriction. In retrospect, work restriction would not be required from an exposure standpoint. However, at the time of the March 22, 1976 sample, without the aid of the hindsight, no one knew this would definitely be the case. Since this high excretion rate was not followed or evaluated for some unknown reason, PAD should take such steps that are necessary to prevent this from recurring.

E. Toxic Chemical Air Sample

The industrial hygiene group consists essentially of only one person. As a result, minimal success has been obtained in establishing an air sampling program for toxic material. Presently, the program consists of air samples by request. An additional staff member will be added, and his prime function will be air sampling and the associated calculation of time-weighted averages for personnel exposure.

V. Contractor Performance Rating in Health Physics

The current health protection program at PAD is rated satisfactory.

R. D. Smith
Health Physicist

B. J. Davis
Health Physicist